

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 13 MAR 2006

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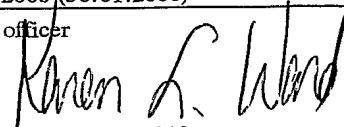
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Applicant's or agent's file reference 030440WO	FOR FURTHER ACTION	See Form PCT/IPEA/416
International application No. PCT/US04/32106	International filing date (day/month/year) 29 September 2004 (29.09.2004)	Priority date (day/month/year) 08 October 2003 (08.10.2003)
International Patent Classification (IPC) or national classification and IPC IPC(7): H04L 1/06, H04B 7/08, H04B 7/06 and US Cl.: 375/267		
Applicant QUALCOMM INCORPORATED		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 5 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
 - a. ☐ (sent to the applicant and to the International Bureau) a total of ___ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) ___, containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| ☒ | Box No. I | Basis of the report |
| ☐ | Box No. II | Priority |
| ☐ | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| ☐ | Box No. IV | Lack of unity of invention |
| ☒ | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| ☐ | Box No. VI | Certain documents cited |
| ☐ | Box No. VII | Certain defects in the international application |
| ☐ | Box No. VIII | Certain observations on the international application |

Date of submission of the demand 13 April 2005 (13.04.2005)	Date of completion of this report 30 January 2006 (30.01.2006)
Name and mailing address of the IPEA/ US Mail Stop PCT, Attn: IPEA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Khal Tran  Telephone No. 571-272-3019

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International application No.

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on:

- ☒ the international application in the language in which it was filed.
- ☐ a translation of the international application into English, which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4(a))
- ☐ international preliminary examination (under Rules 55.2(a) and/or 55.3(a))

2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ the international application as originally filed/furnished
- ☒ the description:
- pages 1-20 as originally filed/furnished
- pages* NONE received by this Authority on _____
- pages* NONE received by this Authority on _____
- ☒ the claims:
- pages 21-28 as originally filed/furnished
- pages* NONE as amended (together with any statement) under Article 19
- pages* NONE received by this Authority on _____
- pages* NONE received by this Authority on _____
- ☒ the drawings:
- pages 1/6-6/6 as originally filed/furnished
- pages* NONE received by this Authority on _____
- pages* NONE received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to the sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>NONE</u>	YES
	Claims <u>1-34</u>	NO
Inventive Step (IS)	Claims <u>NONE</u>	YES
	Claims <u>1-34</u>	NO
Industrial Applicability (IA)	Claims <u>1-34</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and Explanations (Rule 70.7)

Please See Continuation Sheet

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of:

V. 2. Citations and Explanations:

Claims 1-34 lack novelty under PCT Article 33(2) as being anticipated by Ketchum et al. (US 2003/0108117).

Regarding CLAIM 1

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 is not new in the sense of Article 33(2) PCT.

Ketchum et al. (US 2003/0108117) discloses a MIMO system with channel eigenmode decomposition. The abstract ('108117) already discloses a method of spacial processing in a wireless MIMO system using a plurality of spacial channels and the use of steering vectors at the transmitter. A spacial filter with a response derived based on a MMSE criterion is disclosed especially in paragraphs 96-141. Thus all the features of claim 1 are disclosed.

It seems that claim 1 is also not novel with respect to document Ketchum et al. (US 2003/0185310) or Ling et al. (US 2003/0003880) which both disclose (see the respective references in the ISR) all the features of claim 1.

Regarding CLAIM 19

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 19 is not new in the sense of Article 33(2) PCT.

Claim 19 deviates from the wording of claim 1 only in the feature that a plurality of transmit antennas is claimed.

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Supplemental Box

The latter feature is, however, already disclosed by Ketchum et al. (see Fig. 1, '108117).

It seems that claim 19 is also not novel with respect to document Ketchum et al. (US 2003/0185310) or Ling et al. (US 2003/0003880) which both disclose (see the respective references in the ISR) all the features of claim 19.

Regarding **CLAIM 11**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 11 is not new in the sense of Article 33(2) PCT.

Ketchum et al. (US 2003/0108117) discloses a receiver unit for a wireless MIMO system (see Fig. 3). The abstract of D1 already discloses a method of spacial processing in a wireless MIMO system using a plurality of spacial channels and the use of steering vectors at the transmitter. A spacial filter with a response derived based on a MMSE criterion is disclosed especially in paragraphs 96-141. Thus all the features of claim 11 are disclosed.

It seems that claim 11 is also not novel with respect to document Ketchum et al. (US 2003/0185310) or Ling et al. (US 2003/0003880) which both disclose (see the respective references in the ISR) all the features of claim 11.

Regarding **CLAIM 15**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 15 is not new in the sense of Article 33(2) PCT.

Claim 15 differs from the wording of claim 1 only in that a receiver "apparatus" is claimed and the words "means for" were inserted. Claim 15 is therefore not novel for the same reasons as given above for claim 11 with regard to Ketchum et al. (US 2003/0108117), Ketchum et al. (US 2003/0185310) or Ling et al. (US 2003/0003880).

Regarding **CLAIM 26**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 26 is not new in the sense of Article 33(2) PCT.

Ketchum et al. (US 2003/0108117) discloses a transmitter for a wireless MIMO system (See Fig. 2). The abstract of D1 already discloses a method of spacial processing in a wireless MIMO system using a plurality of spacial channels and the use of steering vectors at the transmitter. A spacial filter with a response derived at the receiver based on a MMSE criterion is disclosed especially in paragraphs 96-141. Thus all the features of claim 26 are disclosed.

It seems that claim 26 is also not novel with respect to document Ketchum et al. (US 2003/0185310) or Ling et al. (US 2003/0003880) which both disclose (see the respective references in the ISR) all the features of claim 26.

Regarding **CLAIM 30**

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 30 is not new in the sense of Article 33(2) PCT.

Claim 30 differs from the wording of claim 26 only in that a transmitter "apparatus" is claimed and the words "means for" were inserted. Claim 30 is therefore not novel for the same reasons as given above for claim 26 with regard to Ketchum et al. (US 2003/0108117), Ketchum et al. (US 2003/0185310) or Ling et al. (US 2003/0003880).

Regarding **CLAIMS 2-10, 12-14, 16-18, 20-25, 27-29, 31-34**

Dependent claims 2-10, 12-14, 16-18, 20-25, 27-29, 31-34 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty or inventive step (Article 33(2) and (3) PCT).

See especially Ketchum et al. (US 2003/0108117), Fig.2 (228), for the feature of scaling the plurality of filtered symbols claimed in claims 2, 12 and 16.